研究報告

PSYCHOLOGICAL PROCESS OF RISK COMMUNICATION SOMA THEORETICAL CONSIDERATIONS

学習院大学法学部教授　田　中　靖　政

Yasumasa Tanaka
Gakushuin University
1-5-1 Mejiro, Toshima-ku, Tokyo, 171-8588 Japan
yasumasa. tanaka@gakushuin. ac. jp

ABSTRACT

This paper is an attempt to examine the nature of the "psycholoical process" in communicating risk to the public. The major theoretical problem discussed in this paper is the process in which the risks are associated with nuclear energy and greenhouse effects and communicated to the public. On one hand, nuclear energy is opposed because it is considered to create serious radiation risks associated with reactor accidents and high-level radio-active waste disposal. On the other hand, greenhouse gases are suspected to cause irreversible changes in the global climate so that they threaten to affect the behavior of the ocean, food production, eco-system on this planet. The present paper is intended to outline a strategy of risk communication as to how we should cope with these long-lasting global risks. In doing so, some important variables which seem to affect the risk communication are examined on the basis of the results obtained in recent empirical research.

1. WHAT IS COMMUNICATION?

From mentalists to behaviorists, over the last half century, an intensive effort has been made to construct a general model of human behavior. Models which can explain human behavior have recently been constructed by a number of behaviorists. Among these are a variety of "cybernetic models" that variably take into account the communication and control aspects of human behabior. In the simplest terms, these models presuppose a series of pychological processes in which one individual's or organization's behavior, in the form of explicit "outoput" information produced by him or it, is dependent upon the "input" information that an individual or organization may receive from other people or organizations and from the environment. In order to examine their validity and discover their relevance to our problems, let us look briefly at a few of them.

As an initial point of reference, it is useful to keep H. D. Lasswell's classic

formula in mind. The scientific study of communication, he says, involves discovering "Who (the source) Says What (the content), In Which Channel (the chennel), To Whom (the destination), With What Effect (the effect)." [1] There is another type of model, the "cybernetic" one, first introduced by C. E. Shannon and W. Weaver [2] for telephone communication and subsequently adjusted for human communication situations by C. E. Osgood. [3]

On the basis of the theory of these models, we now can make a more formal statement about the nature of human communication behavior. We can assume the existence of various psychlogical processes of "decoding" and "encoding" between input and output events. "Decoding" here refers to the way in which the individual human (or organization) receives input information from his environment---namely, the internal (viz., psychological) reaction caused by the input on the subject. "Encoding" designates those processes whereby individual human (or organization) chooses some response, in the form of output, to the environment surrounding and affecting him. What psychologists term "mediation process" is thus considered as the bridge between decoding and encoding. Even in comparatively simple acts, such as making a speech, an individual's communicating behavior is complex, susceptible to many factors, and it is continuously renewing process whereby he is always adapting to his environment.

At this point the term "feedback" is also relevant. Dealing with the complex organization and the mechanisms of government, Karl Deutsch defines "feedback" as:

> "a communication network that produces action in response to an input of information and includes the result of its own action in the new information by which it modifies its subsequent behavior." [4]

According to this view, the fundamental building block of the social system is the feedback "loop ." By this feedback mechanism, individual humans (and organizations) can correct errors and adjust their behavior to the continuously renewing environment.

Furthermore, in view of the present state of communication technology, interpersonal interaction is no longer limited to a face-to-face situation. The whole or part of an encoded message may be quoted in a newspaper, or broadfcast by radio and television, or transmitted via World Wide Web (WWW) on the Internet, for universal "mass consumption". It has indeed become possible for one to watch a real war via CNN. It has also become possible for one to learn about war by downloading the homepages of international news media. Then, as

the feedback loops become more complex, the source will need more extended "scanning" devices to gather feedback information. The destination, on the other hand, will constantly need to keep eye on the local and national news media and the homepages of various websites to find the kind of informastion he is looking for.

2. GROWING NEED FOR THE SCIENCE OF RISK COMMUNICATION

The term "risk communication" was first coined and used in the United States in the 1980's. [5] The need for "risk communication" has arisen from the very fact that our modern life is increasingly surrounded by such hazards as pollutants in the air and in drinking water; pesticide residues in food and milk; threats from radiation and toxic chemicals; or the global climatic anomalies, such as the greenhouse effect, acid rain or ozone hole. The risk communication is therefore considered as a rational step to enhance the accurate knowledge of these risks.

The gist of risk communication may be summarized as follows:

(1)that it should convey the messages containing information, concerns, and opinions about risk;

(2) that it should involve the continuing feedback loops (dialogues) among the source and the destination; and

(3)that it should be a process of purposive (or persuasive) communication, involving socio-cultural and psychological factors.

In brief, the risk communication may be characterized as:

"an interactive process of exchange of information and opinions, among individuals, groups, and insitutions, involving messages about the nature of risk or expressing concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for risk management". [6]

During the last decade, there was a sharp increase in the number of both theoretical and empirical studies on risk perception and communication, notably in the United States. The emergence of research on risk perception and communication itself may be taken as an indication of the mounting public awareness and concerns about various risks arising from the environmental and other man-made hazards. Comprehensive reviews and summaries of those studies on risk perception and communication can be found in publications by Fischoff (1990), Fischoff *et al.* (1981), Fischoff *et al.* (1987), Morris (1990), National Research Council (1989), and Schwing and Albers (1980). And yet, a model of

systematic risk communication, which should take into account major variables involved in the communication processes---that is, the source, the message, the channel, the destination and the effect---will need to be further developed in the future.

3. CROSS-CULTURAL PERCEPTIONS OF GREENHOUSE GASES AND NUCLEAR ENERGY

The COP3 Conference (The Third Conference of Parties of the United Nations Framework Convention on Climate Change) was held in Kyoto in December of 1997. Tanking advantage of that opportunity, the Sankei Shinbun in Tokyo and the USA TODAY in Washington, D.C. conducted nation-wide telephone polls in a October-Nobember period of that year. The result was published on the Sankei Shinbun on November 24, 1997, prior to the opening of the COP3 Conference in Kyoto.

Out of 10 questions asked, the following two seem most important, relevant to the purpose of the present paper. First, it was found that more Americans than Japanese are hesitant to take energy-reducing action that might reduce the standard of living. Second, Japanese are less receptive than Americans to the idea of increasing the use of nuclear power as an alternative to fossil fuels.

(Insert Table 1 about here)

It must be remembered that nuclear power plants do not emit CO_2 and other greenhouse gases and they already supply the one-fifth of electricity in the United States and nearly the two-fifth in Japan. Despite these facts, more Japanese oppose use of nuclear energy than do Americans. There are at least two possible reasons for the Japanese reluctance to choose nuclear power as an alternative to fossile fuels.

First, there is recent public distrust of nuclear power industry and nuclear regulatory agencies that can be traced to a succession of incidents in government-run nuclear facilities that were not reported to the public in a timely and forthright fashion. These incidents created a serious doubt in the public about the information transparency and credibility.

Second, the focus of public concern is gradually shifting from the risks accrued from nuclear power plants to those which may be accrued from high-level radio-active waste. In many countries where nuclear power plants are in operation, high-level radio-active waste management is still in a formative stage.

Inevitably, many Japanese are not truly convinced of theoretical long-term safety of high-level waste disposal. A half-life of Plutonium contained in high-level radio-active waste is said to exceed some twenty thousand years. Consequently, people tend to perceive high-level radio-active waste as a possible threat to a number of generations to come, as much as they do CO_2 to the global climatic changes.

On the basis of these observations, it seems safe to speculate that the argument that the nuclear power does not emit CO_2 and therefore is a desirable alternative to fossil fuels is neither logical nor persuasive enough, while the public's perception of the risks involved in the global warming is neither sufficient nor serious enough. The public are not sufficiently informed of the complexity of the problem of energy and environment and not at all prepared for seeking how they should cope with the "Three-E Trilemma" ---i.e., Economy (well-being), Energy (less and less use of fossil fuels), and Environment (CO_2 and high-level radio-active waste).

Under this condition, too much emphasis upon the risks of global warming in favor of nuclear power is not very convincing. Conversely, it might evoke negative reactions in the public and increase opposition to this argument as being one-sided. While constant education in the public about the necessity and safety of nuclear power is much needed, this argument has an innate logical weakness, for it totally ignores the future environmental risks which might be caused by disposed high-level waste. On the other hand, the risks of greenhouse gases are still psychologically remote in a large part of the public, even if there is scientific evidence that they are remote but real. Furthermore, many people like those American respondents polled in the 1997 U.S.-Japan telephone surveys appear to consider that government intervention in their own life style (i.e., more conservation of energy at home) is a nuisance. Government intervention in private life may be criticized as infringement on the right of privacy. All told, there is indeed no simple solution for this "Three-E Trilemma" question.

4. CONCLUSIONS

It is important to recognize that, in principle, a risk communication involves a wide variety of events and must be dealt with by a wide range of disciplines, ranging from physical to social and behavioral sciences. Although much is left for future interdisciplinary research, it is important to note that solutions

of many contemporary risk problems rest upon the socio-politico-psychological relations with the public. Many of these risk problems are basically to be coped with by social and behavioral scientists. This is partly because the risks today is so much embedded in society that people's choices and initiatives today are among the most decisive factors affecting the state of post-industrial society tomorrow. Political scientists are quite keen to remember the classic principle of democratic decision-making: "People Shall Judge." The present paper is an attempt to stimulate new ideas and encourage further discussions on this subject.

In concluision, it should be kept in mind that the following factors are most relevant to effective risk commnications.

(1)The Source:

The best source must be neutral, authoritative and respected, and regarded as credible. From this point of view, people in government or in industry may not always be the best source, because they are already "the party concerned" and take sides. The most credible source must always stand outside the disputed issues and areas. Widely-known eminent scholars or respected critiques might meet with the qualifications of the best source. In addition, it is important for the source to respect the lay audience as fellow citizens and display sympathy and empathy on them.

(2)The Message:

First, it is important to remember that deed is a message. In many cases, the most effective communication is by deed, not by word. For example, people respect honesty, and they respect those whose word and deed are consistent. Conversely, if a promise by word is broken by deed, people quickly lose confidence. Once confidence is lost, it takes long before it is recovered.

Second, whatever form and style it may take, the message must be clear, objective and easy enough for lay people to understand it. It must also be remembered that use of technical terms is legitimate only in the communication with fellow professionals. Technical terms not only may not reach the lay audience but may alienate them. It is considered safe to avoid use of technical terms as much as possible in the communication with the lay public.

Third, many people today are accustomed to a combination of visusal (color,

figure, and movement) and auditory (voice and sound) messages in their daily exposure to television. In this respect, written words may not always be the best means of communication. In a television age, people want short-cut messages to save time. The Zipf's law (the maximum effect with the least effort) seems to apply to the human communication behavior. Consequently, the message must be encoded in such a way that the receivers can satisfy their own psychological need (interest, concern, curiousity, or getting a response, etc.) with the least effort in decoding. When the message is to be encoded, this principle must not be overlooled.

Fourth, the encoded message should not give the receiver an impression of "imposition." It may be safe to say that an explicit attempt "to teach" pople should be avoided. By definition, "to teach" means a "top-down" communication, which discriminates between the "teacher" (the superior) and the "student" (the subordinate) roles. At schools this role differentiation is legitimate. In the risk communication situations, however, the general audience are by no means assumed to be "students". To put it in another way, risk communicators should not try to "teach" the public. Instead, they should try to share needed information with the lay public and, in doing so, appeal to the public's emotions, evoke their interest, and increase their understanding. The best literary pieces or the best theatrical performances would never try to "teach" the audience but "evoke" their empathy.

(3)The audience (Destination):

The audience is neither monolithic nor homogenous. They are divided into a number of different segments varying in demografic attributes, attitudinal characteristics and information needs. Just as marketers sell products, risk communicators transmit information regarding risks. The marketers frequently conduct marketing research and constantly analyze the consumers' changing preferential behaviors in order to increase their sales. Like the marketers, the risk communicators must know in advance as to who the consumers of their information are, and what psychological and information needs their product, the risk communication content, should meet. Comprehensive audience research may be needed, therefore, prior to the formulation of any specific risk communication strategy. In this respect, risk communicators seems to have a lot of things to learn from other industries, such as apparel (fashion) and automobile industries, whose buisiness is much closer to the consumers' day-to-day life and more affected by the consumers' preferential behavior.

(4) The channels:

A notion of "media mix" has been developed in advertising and public relations. To reach a specific segment of the audience, the best combination of channels, usually called "media mix", may be chosen, ranging from television and radio (the electric media) to newspapers, magazines and comic books (the printed media). Such combinations may vary, as the target audiences differ. Audience research provides information needed for selection of the most effective combination of communication channels. In addition, new electronic communication channels, such as World Wide Web or E-mail, may provide effective communication channels for a world-wode distribution of information. Risk communication messages may be "broadcast" via E-mail for individuals or via World Wide Web for universal mass consumption across the national borders. World Wide Web seems to have a unique advantage. It enables the receivers to receive video- or sound-clips in real time from any part of the world, at any time of the day, and at any place. Risk communicators must elaborate the use of these new electronic multi-media in combination with older mass media. FAQ's (Frequently Asked Questions) on risks would continuously "flow" through the World Wide Web and help the global mass audience not only "self-educate" on the nature of these risks but also "learn" how to cope with them.

(5) The Feedback and the Effect:

Finally, a feedback communication, or a dialogue, may be thought of as the most important factor for effective communications. Usually, one-way communication cannot eliminate the uncertainty contained in the message. By one-way communication, a question which might arise from the message may be left unanswered. In a dialogue, exchanges of communication continue until all questions, or nearly all questions, are answered. Then, most of the uncertainty may be removed. Furthermore, only with the presence of feedback loops, everyone can participate equally and freely in the renewing communication process. Equal participation is equal commitment. This is particularly important for the communication on controversial issues, such as long-term risks of the high-level radio-active waste or the greenhouse gases. An equal opportunity for free participation and the openness may serve as a building-block for the feeling of togetherness and help develop a sense of trust. Risk communication seems no exception to this general principle of communication.

FOOTNOTES

1. Lasswell, H. D. 1948. "The Structure and Function of Communication in Society." p 37.
2. Shannon, C. E. and Weaver, W. 1949.
3. Osgood, C. E. 1963. "Psycholinguistics." p 247.
4. Deautsch, K. W. 1963. p 88.
5. National Research Council. 1989. p 321.

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Table 1. The 1997 U.S.-Japan Opinion Polls on Energy and Environment.

Question (1):
"One suggestion for reducing the problem of global warming is to limit the amount of energy that individuals would be allowed to consume when using such things as air conditioners and automobile. Which of the following statements comes closer to your view of this suggestion?
(1) Limiting the amount of energy that individuals can use is a good idea because it would be effective at preventing global warming.
(2) Limiting the amount of energy that individuals can use is a bad idea because it would reduce the standard of living of many people."

	Japan	U.S.A.
(1)Accept the limitation	81 (%)	49 (%)
(2)Reject the limitation	12	40
(3)Others	2	6
(4)No opinion	5	5
Total	100	100

Question (2):
"Another suggestion for reducing the problem of global warming is to increase the use of nuclear power as a source of ene rgy and to decrease the use of fossil fuels, such as oil and gas. Would you, personally, favor or opose the increased use of nuclear power as a source of energy in order to prevent global warming?"?

	Japan	U.S.A.
(1)Favor	28 (%)	39 (%)
(2)Oppose	40	49
(3)Others	8	2
(4)no opinion	24	10
	100	100